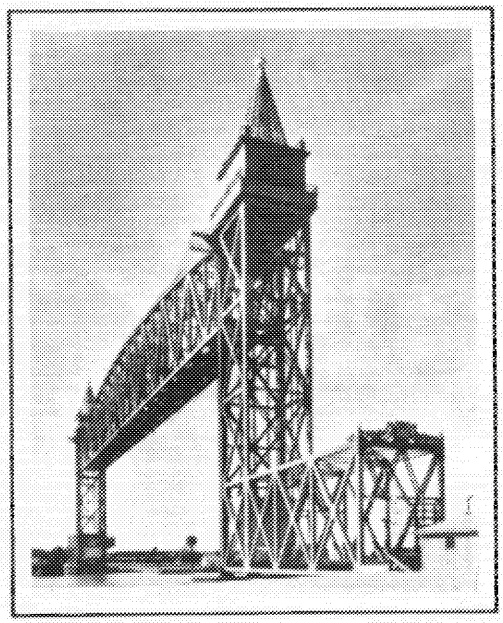
CAPE COD CANAL



BUZZARDS BAY RAILROAD BRIDGE

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE
PARK SQUARE BUILDING BOSTON

C A P E C O D C A N A L

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I. HISTORY.

The need of a waterway across Cape Cod, connecting Cape Cod Bay with Buzzards Bay, was recognized by the Pilgrims soon after their arrival at Plymouth in 1620. Trade with the Dutch colonists of New Amsterdam assumed some importance shortly after the Plymouth colony was established; but communication between the two colonies was seriously hampered by the presence of Cape Cod peninsula, whose hazardous shores and 65 miles of length presented a formidable obstacle to transportation by water, the only means of distant communication then available.

A measure of relief was afforded, however, by the fact that near the base of the peninsula, where the width was about 7 miles, were two tidal streams, one flowing easterly into Cape Cod Bay and the other westerly into Buzzards Bay. The former was known as Scusset River and the latter as Manamet (now Monument) River.

In 1623, Myles Standish, then military leader of Plymouth colony, ascended the Scusset River and crossed the sand ridge lying between the source of that stream and Manamet River to meet vessels from the Dutch colony in the Manamet River, thus initiating a trade route which for reasons of economy, safety and expeditious transit, continued to grow in importance as traffic along the North Atlantic coast increased. Near the mouth of the Manamet River, Plymouth colony's first trading post, known as Aptucxet, was established by Governor William Bradford in 1627, to "avoyd the compasing of Cap-Codd and those deangerous shoulds; and so make any vioyage to ye southward in much shorter time, and with farr less danger." Here the New Amsterdam traders brought sugar, tobacco and "Holland finer and coarser stuffs" and the Aptucxet

trading post was the scene of bartering and exchange activities to relieve the urgent needs of the settlers of Plymouth.

The speculative idea of a canal across the neck of Cape Cod must undoubtedly have intrigued travelers as they trekked between these two rivers along the well-worn path on the dividing ridge, which was about 3 miles long, with an elevation of less than 30 feet above high water. Traders, seamen and others with a stake in the commerce between the Dutch and English colonists no doubt discussed the prospect of a canal after the establishment of the trading post at Manamet. In Samuel Sewall's Diary, which gives a valuable picture of early New England, is the following notation of a reconnaissance of the canal route in 1676:

> "26 Octo'r, 1676. Mr. Smith rode with me and showed me the place which some had thought to cut, for to make a passage from the south sea to the north.....the land very low and level..... Moniment harbor said to be very good."

There appears to have been no official recognition of the project, however, until 1697 when the General Court of Massachusetts adopted the following resolution:

> "WHEREAS, it is thought by many to be very necessary for the preservation of men and estates, and very profitable and useful to the public, if a passage be cut through the land at Sandwich from Barnstable Bay, so called, into Monament (sic) Bay, for vessels to pass to and from the western part of this country,
>
> "ORDERED, that Mr. John Otis, of Barnstable, Capt. William Bassett and Mr. Thomas Smith, of Sandwich, be and hereby are appointed to view the place, and make report to this court, at their next sessions, what they judge will be the General Conveniences and Inconveniences that may accrue thereby, and what the charge of the same may be, and probability of effecting thereof."

There appears to be nothing of record which would indicate that a written report was submitted in pursuance of the above order, or that the General Court carried the proposal any further at that time. However, the idea of a waterway across the peninsula continued to form a topic of discussion. In Prince's Annals, under date of 1736, the peninsula of

Cape Cod is described as "the place through which there has been a canal talked of this forty years which would be a vast advantage to all the country by saving the long and dangerous passage around the Cape, and through the shoals adjoining."

On May 1, 1776, the General Court adopted a resolution appointing a committee to determine the practicability of constructing the canal. The committee employed an engineer, Mr. Thomas Machin, then in the service of the United States, who examined and surveyed the route, perhaps incompletely, due to being ordered by General George Washington to return to New York on June 10, 1776. The canal proposed by Machin was 14 feet deep, having two double locks at each end, and two bridges; excavation of 982,058 cubic yards of material was required, all at an estimated expenditure of 32,148 pounds, 1 shilling, 8 pence.

After the Revolutionary War, separate groups of proponents urged the construction of a canal across the Cape, each favoring a different location. In fact, from 1791, when another committee was appointed by the Commonwealth of Massachusetts to study the problem, to 1818, the subject was under continuous consideration. The various routes here referred to are shown in Fig. 1. While each route would effect a saving in distance, the Boat Meadow Creek-Nauset Harbor route would not avoid the dangerous shoal waters in Nantucket Sound.

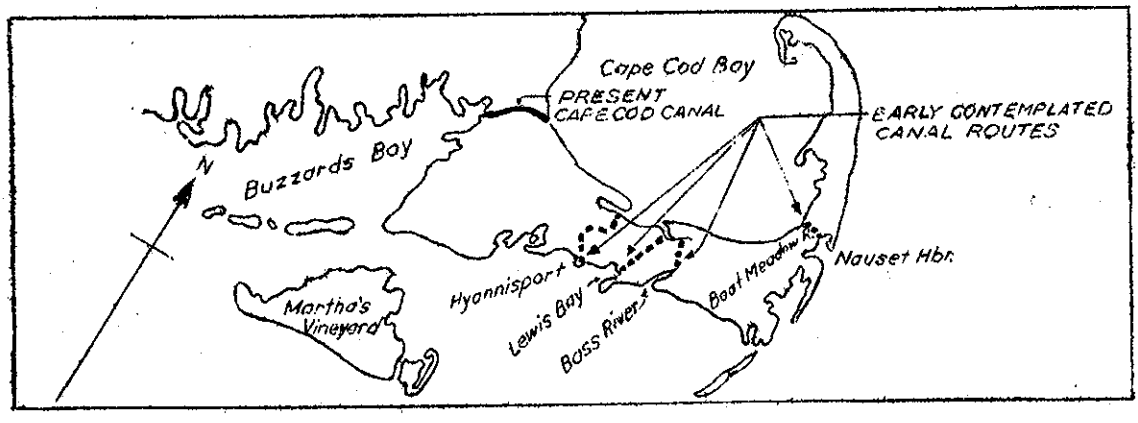
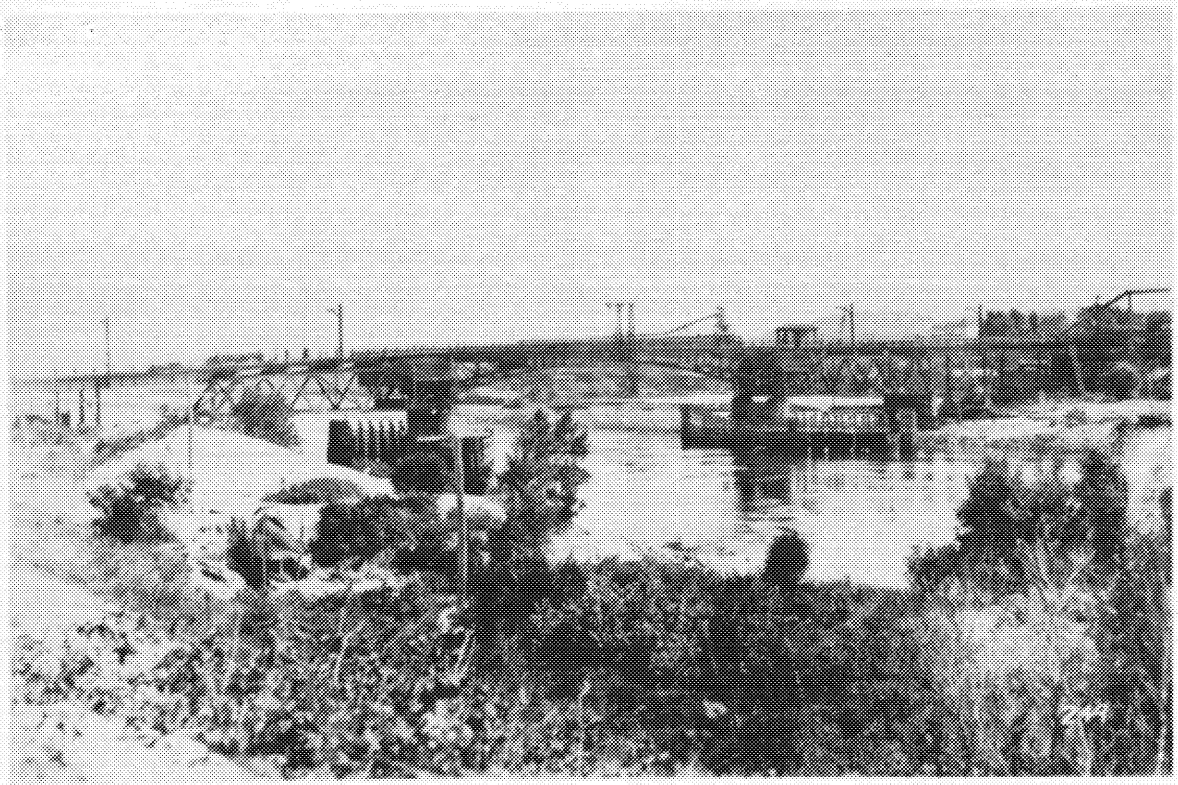


FIG. 1.

The strategic value of a Cape Cod canal was appreciated during the War of 1812 when the British fleet maintained a blockade from Boston Harbor to Sandy Hook. Federal interest in and recognition of the value of a canal appeared in 1818. In 1824, an act of Congress authorized the President to cause "necessary surveys, plans and estimates to be made of the routes of such roads and canals as he may deem of national importance in a commercial or military point of view....." Major J. H. Perault, U. S. Topographical Engineer, was in charge of this survey. After studying various designs, Major Perault submitted a proposal for a canal 36 feet wide and 8 feet deep, with a lock at each end. No action was taken on this report.

It may serve to enhance the background of the Cape Cod Canal to digress and mention that during this period, Congress ordered another survey to determine the feasibility of connecting Boston Harbor and Narragansett Bay by an inland waterway. Two routes were surveyed: One, beginning at Weymouth Back River, passed through Weymouth, Abington, East Bridgewater, thence through Middleboro and Taunton to Assonet Bay on Taunton River; the other, beginning at Weymouth Fore River, passed through Braintree, Randolph, West Bridgewater and Raynham to Taunton River. There is no record of any action on these surveys.

From 1830 to 1860, the idea of a canal across Cape Cod received little public consideration. Aided by the railroads and the advent of steam vessels, the commercial activity of New England ports, the port of Boston particularly, was steadily increasing. Foreign trade formed the more important part of Boston's commerce, and domestic water-borne trade assumed a less dominant role. This period in the growth of the port of Boston was climaxed by the development of the clipper ship, following the discovery of gold in California and the repeal of the British navigation acts.



Old Sagamore Highway Bridge, looking east. August 1922.

New Sagamore Highway Bridge. May 1938.

However, with the increasing number of steam vessels in the middle of the century, the character of the maritime commerce of Boston underwent a change, and the domestic trade became relatively more important. Once more, public interest in a canal was aroused by the Massachusetts General Court.

In 1860, following an investigation authorized by the Massachusetts legislature, a committee composed of members of that body reported that "the construction of a ship channel or canal.....is a practicable enterprise, quite within the range of this class of improvements; that when constructed it will become the thoroughfare of the coasting trade, shorten distance, save life and property, and materially reduce the cost of transportation;....." Further, to support this opinion, the committee reported that about 10,000 vessels passed around the Cape annually, carrying miscellaneous cargoes, and that in the 17-year period ending with the year 1859, there had been 827 marine disasters, with an average annual loss estimated at $600,000. This report was another in the long list of reports and studies which successively emphasized the importance of a canal across the isthmus of Cape Cod. It contained a recommendation for a canal without locks, the first recorded proposal of a sea-level canal.

Although the Commonwealth of Massachusetts took no steps toward constructing the canal as a public waterway, private capital soon became interested in such a canal as a corporate enterprise. By an act of the General Court of Massachusetts in 1870, the Cape Cod Ship Canal Company was authorized to raise money and dig a canal connecting the two bays. Hydraulic problems of a canal were studied for the company by Mr. Clemens Herschel, an eminent civil engineer. However, the charter lapsed before any actual construction was undertaken.

Thereafter, the Commonwealth of Massachusetts granted in succession charters to several corporations. Under only two of these charters were any tangible results achieved.

Under the first of these, an act of the Massachusetts General Court in 1883 incorporated the Cape Cod Ship Canal Co., with a capital stock of $5,000,000. Work was actually begun, and a channel about 1 mile long, 15 feet deep and 100 feet wide, was excavated through the sandy marshes of the Scusset River with a dredge built especially for this work. More than eighty per cent of the right-of-way had been acquired when financial and other difficulties terminated the canal construction, and this charter lapsed.

The last charter to be granted by the Commonwealth of Massachusetts for the canal was given to the Boston, Cape Cod, and New York Canal Company in 1899. This company actually succeeded in joining the waters of Buzzards Bay and Cape Cod Bay. The years following the granting of this charter were devoted to study and planning for the canal, and to negotiations for financing it. On March 27, 1907, a contract for the construction of the canal was awarded by the Boston, Cape Cod, and New York Canal Company to the Cape Cod Construction Co., the only bidder, whose officers were practically the same as those of the Canal Company. Construction was begun on June 19, 1909, when the first block of granite was placed in the breakwater at the easterly end, and on July 4, 1914, the waters of Cape Cod Bay and Buzzards Bay met. On July 30, 1914, the canal was opened to navigation, for vessels drawing not more than 15 feet. Thereafter the work of enlargement was continued, and on April 11, 1916, the canal was completed to a minimum bottom width of 100 feet and a depth of 25 feet at mean low water.

During the World War, the operation of the Cape Cod Canal was taken over by the United States, under the Railroad Administration. On March 1, 1920, when an attempt was made to return the canal to its owners, they refused to accept it on various legal grounds, proposing instead that the Government purchase it. As a result of the controversy, the canal was closed for three days until March 4, 1920, at which time it was reopened through a temporary arrangement between the Canal Company and the United States, pending settlement of the various issues at stake. After several years of litigation and negotiation, authority for the purchase of the canal was granted by Congress in the River and Harbor Act of January 21, 1927. (A report of these negotiations can be found in House Doc. No. 795, 71st Congress, 3d sess.) The ownership and operation of the Cape Cod Canal were taken over by the United States on March 31, 1928. The capital cost to the United States was $11,500,000. Before the canal was turned over to the Government, it was redredged to a bottom width of 100 feet and a depth of 25 feet at mean low water. Since that date, the canal has been under the control of the War Department, Corps of Engineers, and under the immediate direction of the District Engineer, U. S. Engineer Office, Boston, Mass.

Prior to the period of Federal ownership, vessels using the waterway were required to pay a toll, in which rates varying from three cents to more than ten cents per gross ton were authorized. Since March, 1928, however, the canal has been operated by the Government as a toll-free waterway, with a resultant increase in traffic.

No work of improvement other than maintenance dredging was performed during the first three years of Government ownership and

operation. On March 2, 1931, the Chief of Engineers recommended a project to provide a lock canal with one lock 110 feet wide and 1,000 feet in usable length, having 40 feet over the sills; and a depth in the canal and approaches of 30 feet, with a width of 250 feet in the land cut, a width through Buzzards Bay of 400 feet to Wings Neck in a new straight alignment, and 700 feet beyond Wings Neck; together with a highway bridge of adequate vertical clearance and suitable railroad crossing, and a 15-foot channel into Onset Bay; all at an estimated cost of $23,250,000, with $250,000 annually for maintenance. No action was taken on this report.

In September 1933, the Public Works Administration authorized the construction of two high-level highway bridges and a vertical lift railroad bridge. In December of that year, work was begun on the foundations for these bridges. The highway bridges were completed in the summer of 1935, and the railroad bridge in December 1935. The bridges have a vertical clearance of 135 feet above mean high water; the highway bridges have a horizontal clearance of 565 feet, and the railroad bridge, 544 feet.

In accordance with a resolution of the Committee on Rivers and Harbors, House of Representatives, dated June 13, 1934, an extensive examination and survey was made of the Cape Cod Canal. The report in this connection formed the basis for the existing project, approval for which was given by the River and Harbor Act of August 30, 1935. A complete description of this project is published in Committee on Rivers & Harbors, House of Representatives Document No. 15, 74th Congress, 1st session. Under this authority, the present improvement program was undertaken by the U. S. Engineer Office at Boston. The project provides for a sea-level canal, 32 feet deep at mean low water, with a

width of 540 feet in the land cut, 500 feet in a straight channel in Buzzards Bay to Wings Neck, and 700 feet beyond Wings Neck; a harbor of refuge for small vessels by dredging a channel 15 feet deep and 100 feet wide into Onset Bay; a mooring basin at each end of the canal; and an improved lighting system and other accessory features necessary.

II. ECONOMIC FUNCTION.

The southeast corner of New England, to which the name "Cape Cod" was given by the explorer, Bartholomew Gosnold, in 1602, reaches out in the form of a narrow, hooked spit to one of the two most hazardous sections of the Atlantic coast. It is said that experienced mariners fear the waters to the east and south of Cape Cod more than those off Cape Hatteras. The hazardous region off Cape Cod, known as Nantucket Shoals, and consisting of a bottom of shifting sand over which the depth varies from 1 to 25 fathoms, extends about 70 miles almost due south from the southernmost part of Cape Cod at Monomoy Point to the "Nantucket Light Ship", which marks the outer limit of the area. In traversing the Cape Cod section of the coast, water-borne traffic had, until 1914 (when the canal was opened to traffic), the choice between two routes: the all-sea route outside the Nantucket Light Ship, or the Vineyard Sound route, which entailed navigating a zigzag course through tortuous channels in the Nantucket Shoals area, passable only by a limited number of vessels. The larger vessels were forced to use the route around Nantucket Light Ship.

Although these routes are lighted and well marked, the difficulties attending their navigation are increased by the prevalence in the area of dense fogs caused by vaporization due to the meeting of warm, easterly air currents and cold currents from the Maine coast. The 300-year history of navigation in this section reflects the natural hazardous conditions of this area of shoals, irregular courses, currents, wind, ice and fog, and a general lack of refuge, with a long, tragic list of wrecks and their accompanying toll of lives, cargoes and ships.

"The special economic function of a Cape Cod Canal," as stated in the report of 1922 by Colonel Edward Burr, C.E., "is to provide a route that will be economically more desirable to traffic than the natural routes around Cape Cod, through the elimination of dangers and delays, and the expense resulting therefrom."

The distances between Boston, New York and Philadelphia by the different routes as determined by the U. S. Hydrographic Office are shown in the following table:

Route	Distance (miles)	Increase as compared with the Canal route (miles)
Between Boston and New York		
By Nantucket Light Ship, all-sea route	435	166
By Great Round Shoal and Long Island Sound	351	82
By Pollock Rip Channel and Long Island Sound	334	65
By Cape Cod Canal and Long Island Sound	269	0
Between Boston and Philadelphia		
By Nantucket Light Ship, all-sea route	611	144
By Pollock Rip Channel and outside of Long Island	547	80
By Cape Cod Canal and outside of Long Island	467	0

In addition to the saving in distance afforded by the Cape Cod Canal route, economy of fuel consumption and operating time, and more reliable ship schedules are effected to benefit the water-borne commerce of the North Atlantic coast.

In spite of the increase in canal traffic after its purchase by the Government in 1928, the use of this waterway was limited by its narrow width and shallow depth to the smaller type of vessel. Large vessels were still forced to use the outside route. Moreover, the nature of the Cape Cod Canal improvement, limited at the time of purchase to maintenance dredging, was responsible for accidents occurring within the canal. In the 15-year period prior to 1930, 75 accidents occurred in the canal, causing an estimated loss of $800,000. The cause of most of these accidents can be traced to the narrow channel then existing, to rapid currents, or to their combined adverse influence.

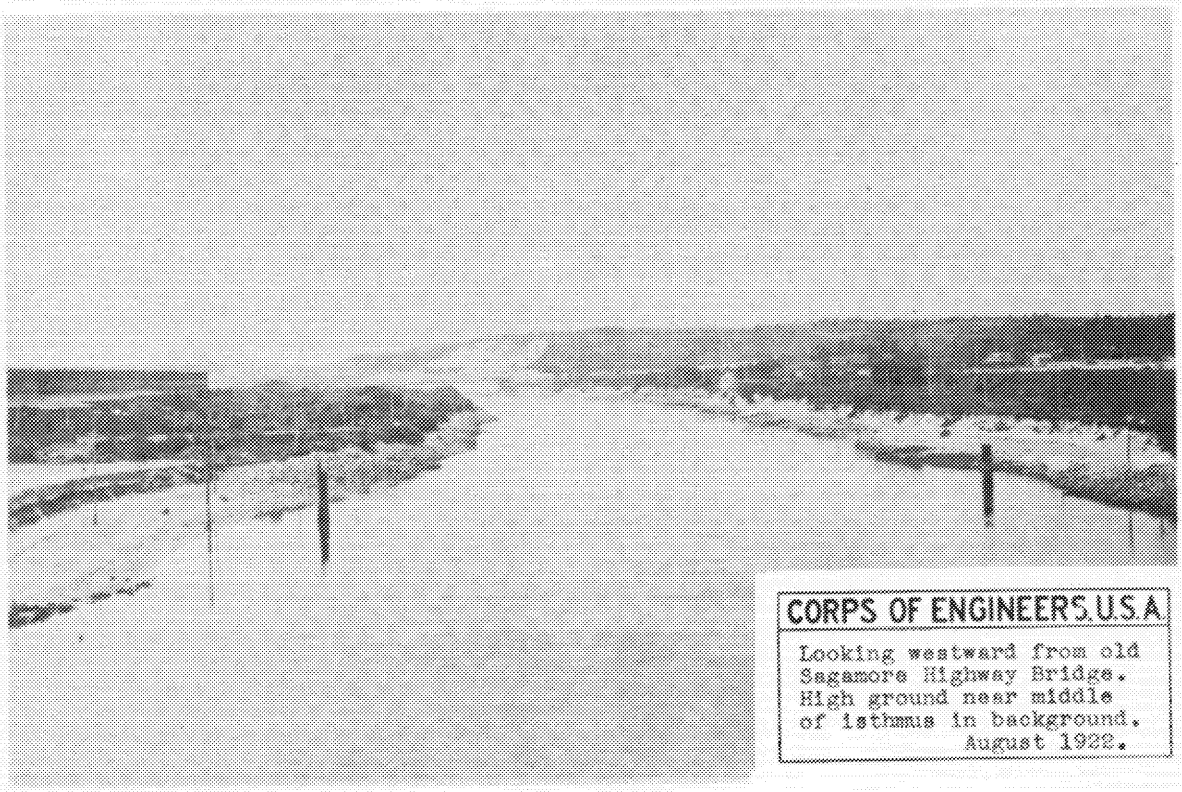
Summarizing briefly, the special economic function of the canal was not completely fulfilled by its original construction or by its ownership and operation by the Government. Because of the limited dimensions, the many benefits accruing from the use of the canal were not available to all classes of shipping. Therefore, as a result of numerous economic studies, physical surveys and hydraulic investigations conducted during the past decade, improvement was undertaken with a view to serving adequately that large and very important part of the nation's water-borne commerce which is tributary to this region. As was described briefly in Section I, page 8, the project by which the present improvements are being accomplished was adopted by the River and Harbor Act of August 30, 1935. Some phases of the work were, however, undertaken at an earlier date, as hereinafter explained, by authority of special provisions of law.

III. PRESENT IMPROVEMENT PROGRAM.

The intensive improvement program now in progress at the Cape Cod Canal was launched in 1933. Work was begun with the construction of the highway and railroad bridges. The existing project provides for a sea-level canal 32 feet deep at mean low water with a width of 540 feet in the land cut, 500 feet in a straight channel in Buzzards Bay to Wings Neck, and 700 feet beyond Wings Neck; a harbor of refuge for small vessels, by dredging a channel 15 feet deep and 100 feet wide into Onset Bay; mooring basins; the construction of two fixed highway bridges having a horizontal clearance of 550 feet between the main piers with a vertical clearance at mean high water of 135 feet; the construction of a railroad bridge with a vertical lift of 500-foot span and 135 feet vertical clearance when the span is raised; an improved lighting system, and other accessory and minor features which may be deemed necessary and to be in accordance with plans approved by the Chief of Engineers.

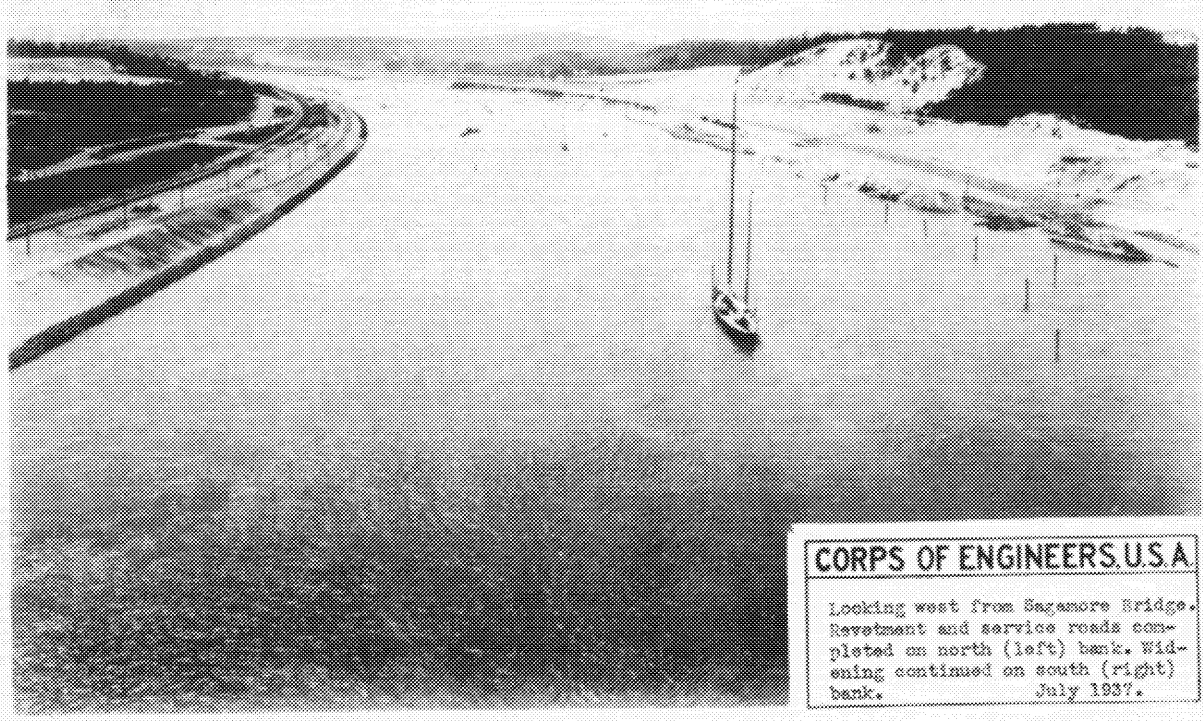
While the existing project was adopted by the River and Harbor Act of August 30, 1935, the purchase of the canal was authorized by River and Harbor Act of January 21, 1927; the construction of the three bridges and the widening of the canal to 205 feet were authorized by the Public Works Administration on September 6, 1933; dredging and bank protection work were authorized May 28, 1935, under the Emergency Relief Appropriation Act of April 8, 1935. On May 1, 1938, the work provided for under the existing project was about 70% completed.

The total length of the Cape Cod Canal is 13.5 miles, including the approach channels at the ends; the channel in the land cut is 7.7 miles long. The mean range of tide in Cape Cod Bay is 9.4 feet, and in Buzzards Bay, 4.0 feet. In addition to differing in range, the tides in these two bays differ in phase and mean tide level. High tide in



CORPS OF ENGINEERS, U.S.A.

Looking westward from old Sagamore Highway Bridge. High ground near middle of isthmus in background. August 1938.



CORPS OF ENGINEERS, U.S.A.

Looking west from Sagamore Bridge. Revetment and service roads completed on north (left) bank. Widening continued on south (right) bank. July 1937.

Buzzards Bay precedes high tide in Cape Cod Bay by approximately three hours; mean tide level in Cape Cod Bay is about 5 inches lower than mean tide level in Buzzards Bay. As a result of these tidal conditions, the currents in the canal change direction every six hours and reach an average maximum velocity of 4 knots. The effect of these tidal phenomena on the projected canal section of 540-foot width and 32-foot depth has been studied with the aid of a model 115 feet in length constructed at the Massachusetts Institute of Technology.

This model yielded valuable data which were useful in planning the present improvement program. It was built of concrete to a horizontal scale of 1:600 and a vertical scale of 1:60. Tides were automatically created by an electrical water-level control mechanism, and water levels at stations along the model were obtained by an electrical water-level indicator. Both devices gave results to 1/100 inch in the model. In addition to the determination of hydraulic data, studies of the model disclosed serious eddy and cross-current conditions in Buzzards Bay in an enlarged canal, which were corrected by the construction of dikes. In the prototype, these dikes were constructed by the disposal in the form of dikes of the material dredged hydraulically from the Buzzards Bay approach channel.

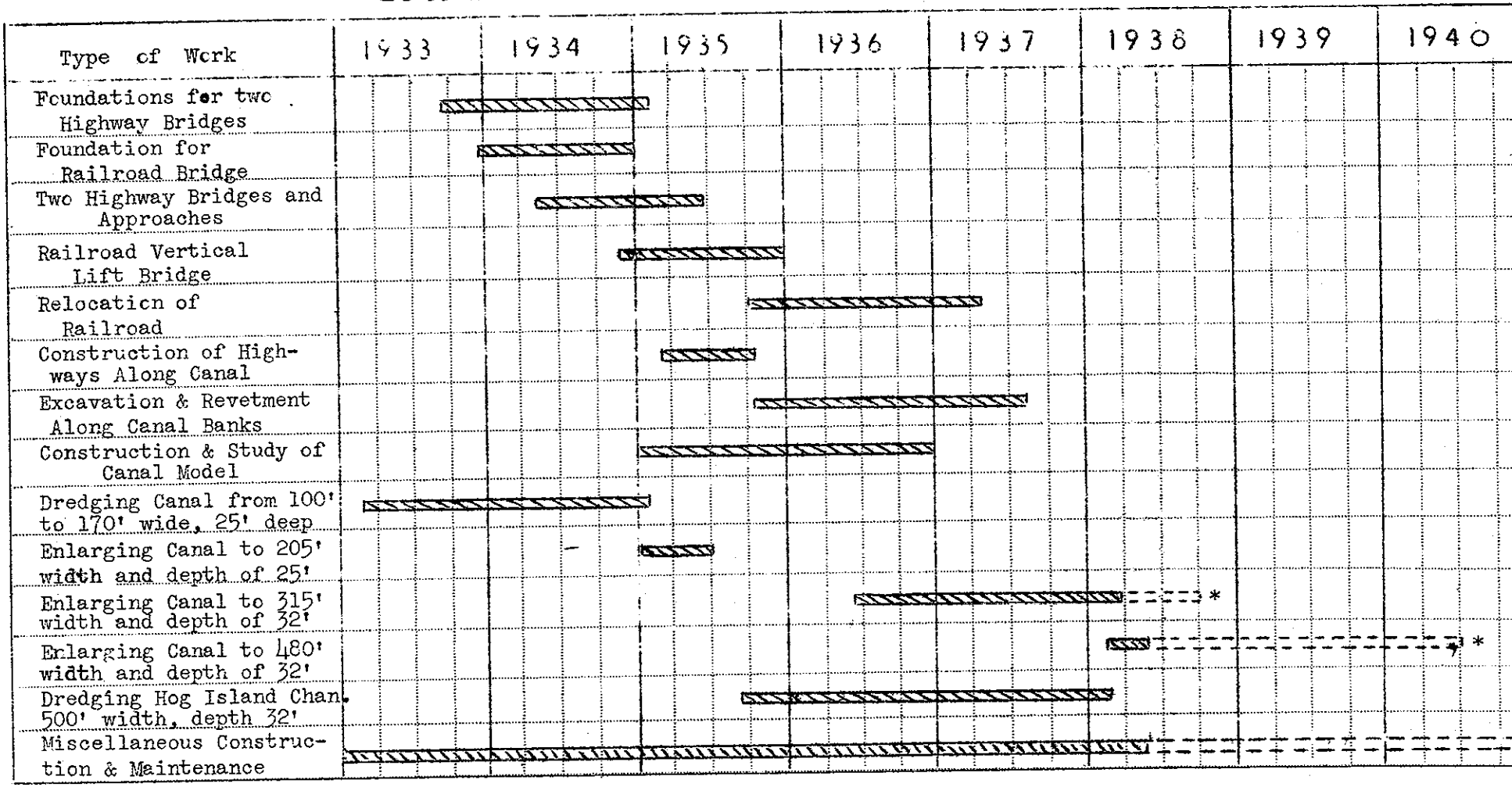
The enlargement program of the canal has progressed continuously since the existing project was adopted. On May 1, 1938, the controlling depth in the land cut section of the canal was 21.6 feet, and a minimum channel width of 205 feet obtained from Stations 275 to 295. However, from the breakwater at the Cape Cod Bay end to Station 110, the canal was 480 feet wide; from Stations 110 to 275, and from Stations 295 to 414 (State pier), the canal width was 315 feet. (Station 0 is at the easterly end of the canal. One station is equal to 100 feet; thus, Station 70 is 7,000 feet west of Station 0.)

The chart on page 15 is a chronological record of the progress of the important parts of the improvement program started in 1933. The Hog Island or Buzzards Bay Channel, which is the straight western approach to the canal, with a width of 500 feet and a depth of 32 feet at mean low water, was opened to navigation April 22, 1937. The mooring basins at the easterly and westerly terminals of the canal are equipped with mooring dolphins; the depth available at the former is 25 feet, and at the latter, 32 feet, both at mean low water.

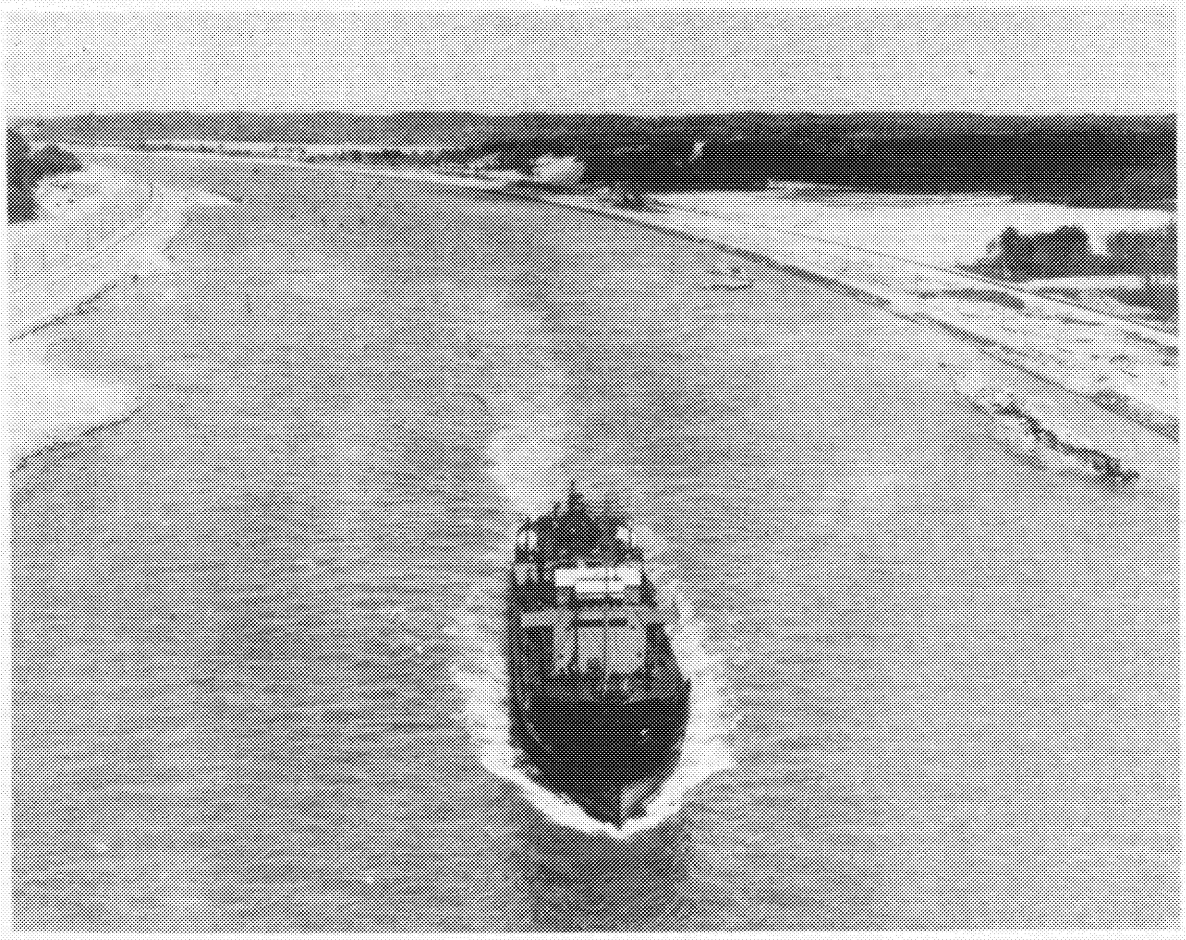
The land through which the canal passes is composed principally of sand, although gravel, cobbles and boulders are present. Much of the sand is fine and capable of being moved by tidal currents and the surface waves caused by wind or the passage of vessels. To preserve and protect the bank slope and alignment of the sides of the canal from this wave wash, revetment 2 feet thick, composed of riprap and crushed stone, and extending from 5 feet below low water to 5 feet above high water, has been placed on both banks for the whole length of the canal. This revetment can be seen on a few of the inclosed photographs. The revetment work has been done largely in the dry, prior to widening the canal by dredging.

At present, a contract is in progress for widening the canal between Stations 205 and 490 from 205 feet to 315 feet, with a 32-foot depth. Work under this contract is about 80% complete. The section between Stations 275 and 295 remains to be widened from 205 feet to 315 feet. To prevent erosion of surfaces of exposed banks and cuts along the canal by wind and rain, slopes are being loamed and seeded with grasses whose roots it is believed will hold the surfaces of the slopes fairly well intact. During the next few years, it is planned to continue dredging operations and further widen the canal. It is expected that the canal will be completed to a 315-foot width and 32-foot depth at mean low water at its least section during the summer of 1938.

PROGRESS CHART
OF
CAPE COD CANAL IMPROVEMENTS



* Estimated date of completion



Modern oil tanker westbound through Cape Cod Canal. May 1938.

Aerial view of new Bourne Highway Bridge. April 1938.

IV. COMMERCE.

The commerce using the canal is growing in volume. Each month, the increasing value of this important link in the intra-coastal waterway from Maine to Florida is more evident. Practically all coastwise vessels clearing from or consigned to northern New England harbors are using this waterway, with the exception of very large freighters and tankers which are excluded at the present time on account of their size. The project depth of 32 feet at mean low water, which it is expected will obtain during the summer of 1938, was selected because it will accommodate nearly all vessels entering or leaving the ports of Boston and Portland. The increase in canal traffic since 1928, shown in Fig. 2, is reflected not only in the number of vessels using the canal, but also in the average size and value of the cargo. From 1928 to 1937, the number of vessels using the canal has increased from 9,312 to 13,113, an increase of about 41%. Vessels in 1928 had an average net registered tonnage of 440, while in 1937, 750, an increase of about 75%. Both the general trend toward the use of larger vessels and the canal improvement program have contributed toward the increase in tonnage.

During this period, the estimated value of the canal commerce has more than doubled, increasing from $80,116,237 in 1928 to $191,287,404 in 1937. Moreover, small-vessel traffic through the canal, such as fishing and recreational craft, has also increased. In 1937, 7,184 vessels of less than 10-foot draft transited the canal, representing an increase of 32% over comparable figures for the preceding year.

The domestic coastwise and intercoastal trade at Boston and Portland, the principal northern New England ports, has averaged almost 14,900,000 tons annually during the past decade, about 12,600,000 tons at Boston and 2,300,000 tons at Portland, Maine. It is estimated that more than 80% of this tonnage passes either around the Cape or through the canal. In this 10-year period, during which the present improvement program described in Section III has been carried on, the domestic traffic through the Cape Cod Canal has been approximately 2,500,000 tons annually. In other words, only about 17% of the total domestic coastwise and intercoastal commerce arriving at and leaving from Boston and Portland used the facilities of the canal during this period.

In May 1938, the limiting width of the canal was 205 feet, and the controlling depth, 21.6 feet at mean low water. These conditions perforce exclude the large freighters, steam colliers and modern oil tankers, which draw in excess of 25 feet. The major portion of the domestic water-borne commerce in the United States is now carried in these types of vessels. It is expected that the project depth of 32 feet will be obtained at the Cape Cod Canal during the summer of 1938. This large and growing class of vessels will then be accommodated, and the traffic at the canal will reflect the commercial and industrial activity of New England. Savings of distance, fuel and time, more reliable ship schedules, and other incidental benefits will be available to practically all coastwise and intercoastal shipping serving this important section of the nation's industrial and economic life.

TABLE I

CAPE COD CANAL STATISTICS

	Cargo Tons				
Year	Foreign	Domestic	Total	Estimated Value	Passengers
1916	-	-	1,351,798	-	139,917
1918	-	-	2,058,197	-	81,998
1920	-	-	2,131,579	-	119,088
1922	-	-	1,387,350	-	113,318
1924	-	-	922,062	-	133,117
1926	-	-	840,063	-	166,787
1928(1)	-	1,405,782	1,405,782	$ 80,116,237	231,426
1929	-	2,165,465	2,165,465	108,358,255	232,824
1930	350	2,498,593	2,498,943	156,947,546	253,727
1931	3,066	2,433,098	2,436,164	126,106,927	230,707
1932	2,825	2,506,494	2,509,319	105,615,704	189,275
1933	4,346	2,800,652	2,804,998	111,246,429	178,642
1934	8,736	2,783,110	2,791,846	114,096,708	201,520
1935	7,497	2,619,879	2,627,376	138,409,453	213,494
1936	33,688	2,767,708	2,801,396	157,022,288	222,791
1937	49,349	3,489,217	3,538,566	191,287,404	274,309
10-year Average 1928-1937	10,986	2,547,000	2,557,986	$128,920,695	222,972

(1) Prior to March 31, 1928, data obtained by Boston, Cape Cod & New York Canal Company.

TABLE II

CAPE COD CANAL STATISTICS

Year	Number of Vessels	Net Registered Tonnage	Average Net Registered Tonnage per Vessel	Steamers	Barges	Motor Vessels	All Vessels under 10-Foot Draft
1916	4,635	-	-	-	-	-	-
1918	4,738	-	-	-	-	-	-
1920	8,140	-	-	-	-	-	-
1922	7,180	-	-	-	-	-	-
1924	5,489	-	-	-	-	-	-
1926	5,259	-	-	-	-	-	-
1928(1)	9,312	4,071,096(2)	435	2,474	1,213	5,040	5,419
1929	10,317	4,485,735	435	3,150	1,597	5,255	5,752
1930	11,464	5,713,321	500	3,353	1,377	6,413	6,446
1931	11,291	6,197,088	550	3,310	1,172	6,291	6,355
1932	10,417	5,745,589	550	3,056	981	6,066	5,761
1933	11,022	6,353,035	575	3,318	1,134	6,298	5,843
1934	11,516	6,799,569	590	3,239	1,002	6,944	6,271
1935	11,589	7,308,885	630	3,398	837	7,097	6,578
1936	12,081	7,860,680	650	3,369	740	7,666	7,177
1937	13,113	9,856,131	750	3,988	810	8,035	7,184

(1) Prior to March 31, 1928, data obtained by Boston, Cape Cod & New York Canal Company.

(2) Net registered tonnage not recorded prior to 1928.

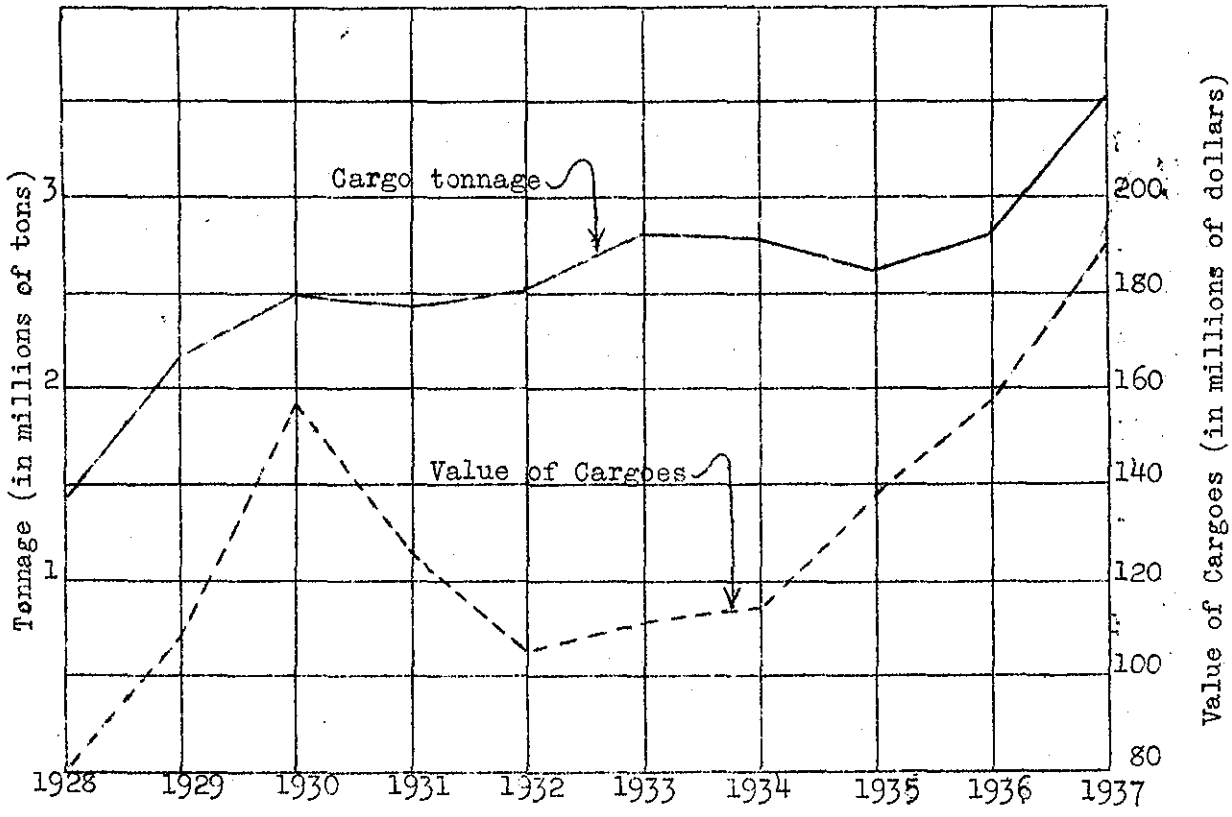


Fig. 2. Traffic at Cape Cod Canal, 1928 - 1937

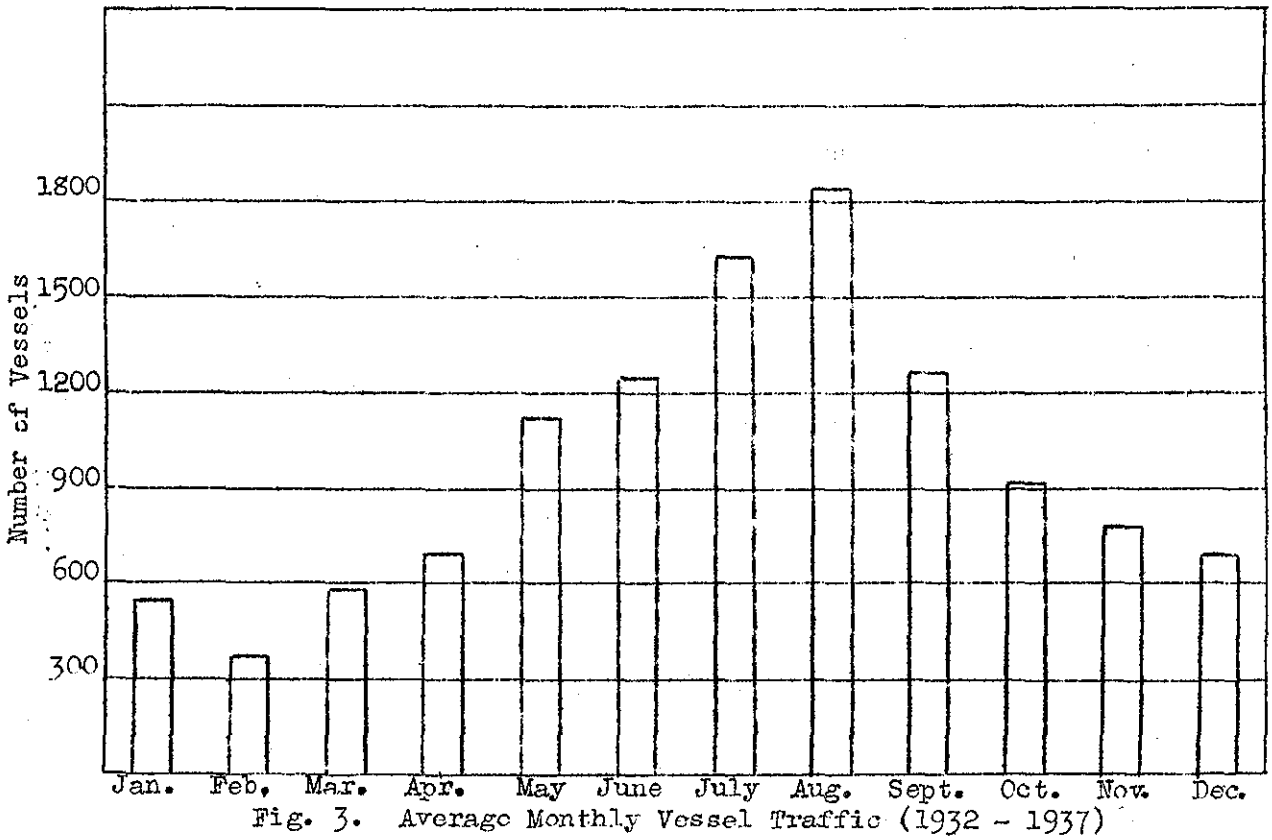
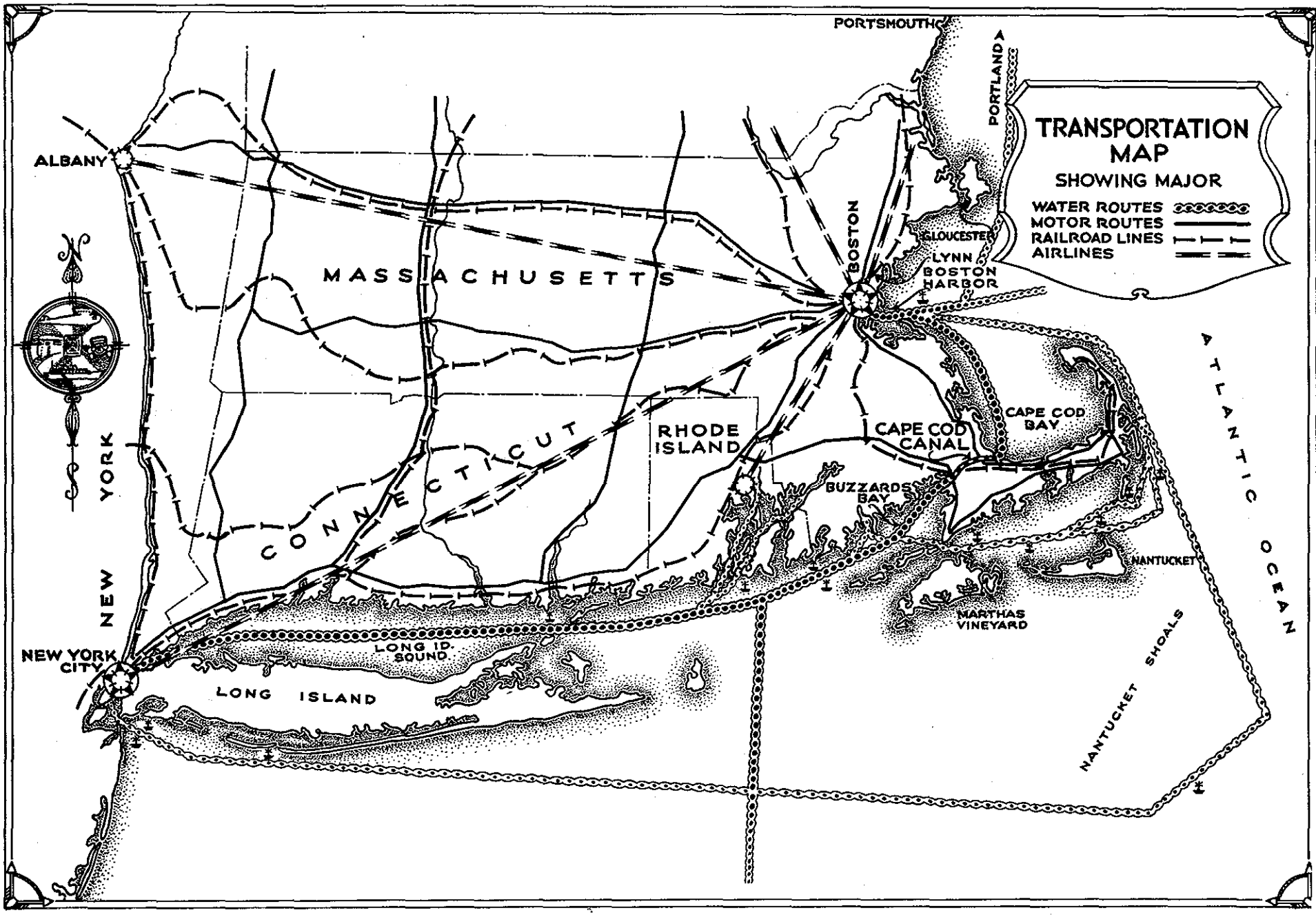


Fig. 3. Average Monthly Vessel Traffic (1932 - 1937)

VI. INTERESTING DATA.

.....Manamet (now Monument), the site of Aptucxet, Plymouth colony's first trading post, is an Indian word meaning "trail of the burden carriers".....The Aptucxet trading post has been restored by the Bourne Historical Society, and is located on the south bank of the canal, about 1/4 of a mile north of the railroad bridge.....The Nantucket shoals of shifting sand, over which the depth varies from less than 1 fathom to 25, were discovered by Verrazzano in 1524, and were recognized by DeMont in 1605 when he named this area "Mallebarre".....Wampampeake, or Wampum, was first introduced to the New England colonists by the New Amsterdam colonists.....The railroad bridge over the Cape Cod Canal has the longest vertical lift span, 544 feet between end bearings, of any railroad bridge in the world..... The Bourne Bridge was awarded a tablet as the most beautiful bridge costing over one million dollars completed in 1934..... "To avoid the shoals and fogs-----projects for a trade route via Buzzards Bay and a canal connecting it with Cape Cod Bay have been proposed for nearly 300 years; in fact,-----has been longer under consideration than any other public work in the United States," W. B. Parsons, Chief Engineer for the Boston, Cape Cod and New York Canal Company in the 1918 Trans. A.S.C.E. Vol. LXXXII, No. 1403.....When completed to project dimensions, the Cape Cod Canal will be the widest artificial waterway in the world.


TRANSPORTATION MAP
SHOWING MAJOR
WATER ROUTES
MOTOR ROUTES
RAILROAD LINES
AIRLINES
PORTSMOUTH
PORTLAND
ALBANY
BOSTON
GLOUCESTER
LYNN
BOSTON HARBOR
MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
NEW YORK
CAPE COD CANAL
CAPE COD BAY
BUZZARDS BAY
NANTUCKET
MARTHAS VINEYARD
NANTUCKET SHOALS
ATLANTIC OCEAN
NEW YORK CITY
LONG ID. SOUND
LONG ISLAND